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Title: w18_plxa Final Report Viewgraphs

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w18_plxa final report viewgraphs

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Goals:

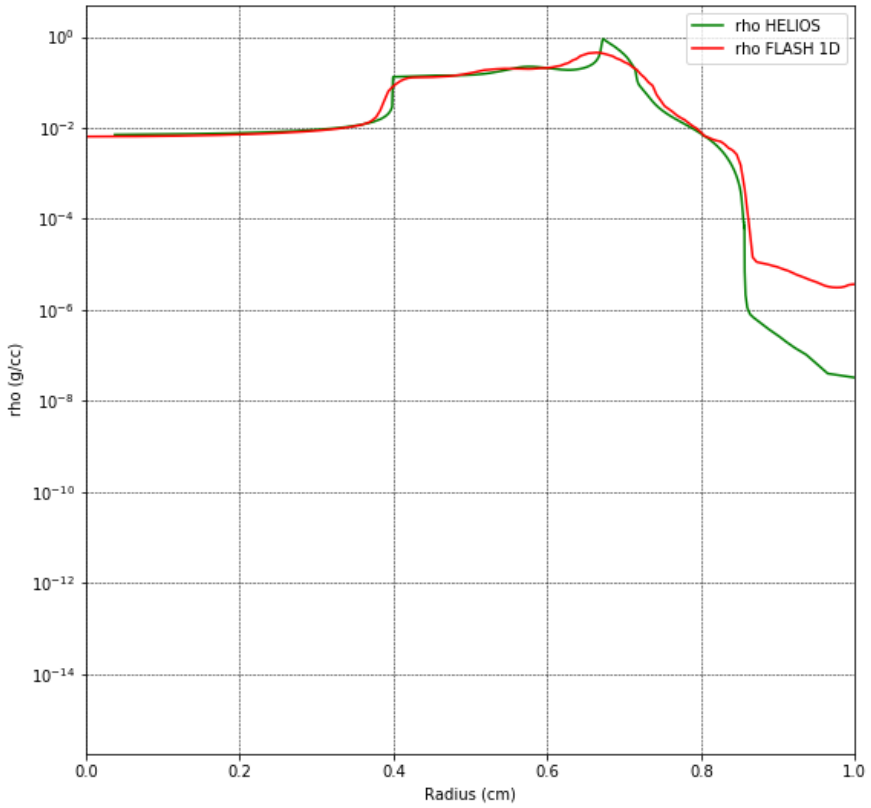
For our fusion concept, we want to look at the influence of

1) Density perturbations of the liner [shell that pushes on the target to get the target to fusion conditions]
2) Magnetic field and anisotropic conductivity effects

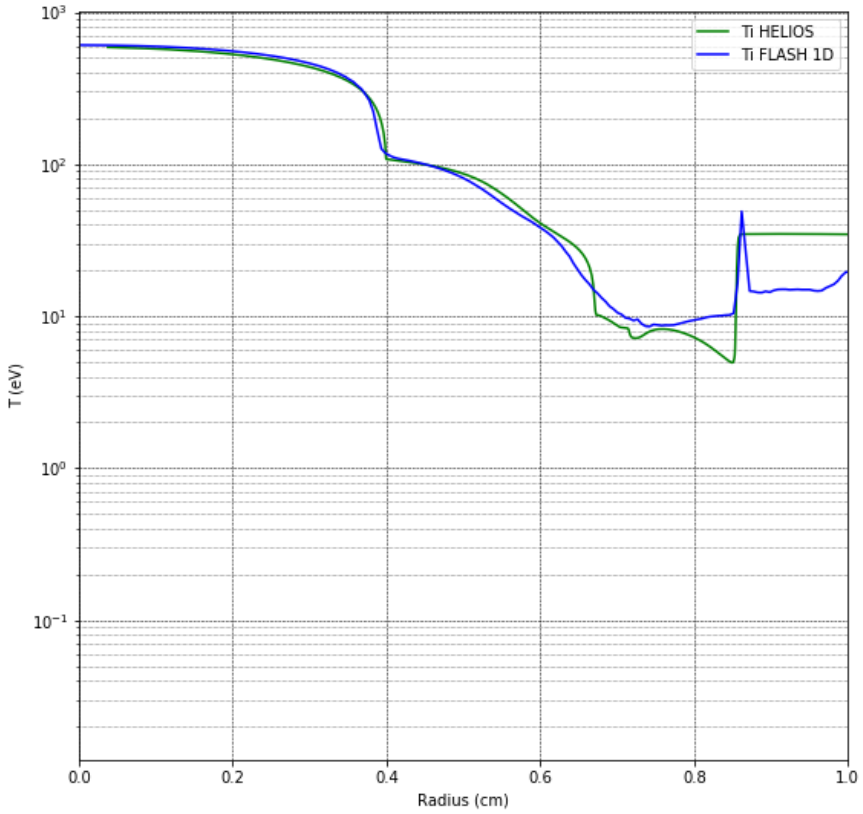
On the compression of the target (final ion temperatures, without nuclear reaction calculations)

We've verified that FLASH (an Eulerien code) results match relatively well with HELIOS (a Lagrangian code)

Density at stagnation time (700 ns)

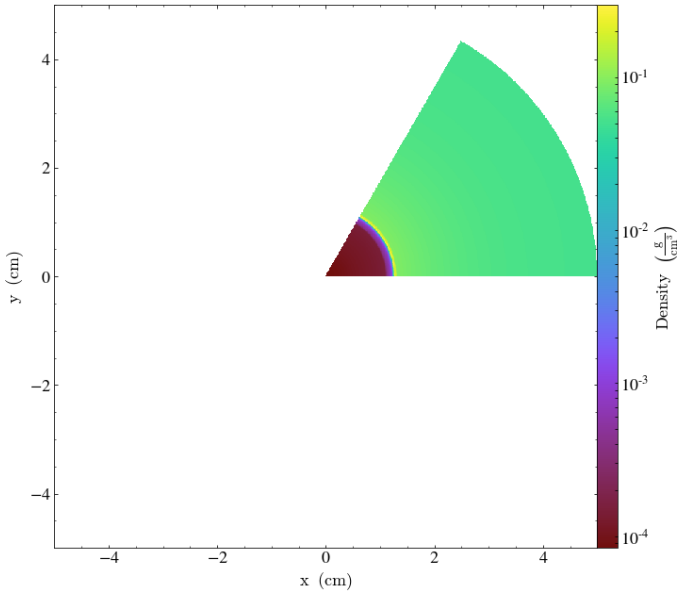


Temperature at stagnation time (700 ns)



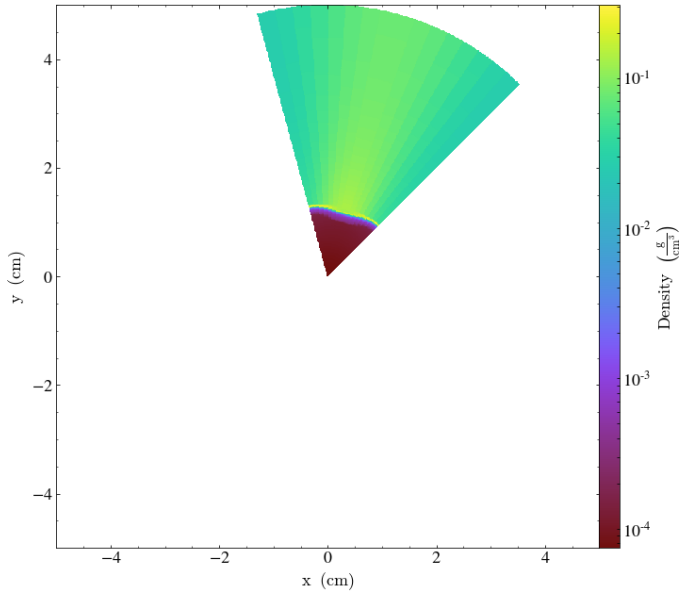
Simulation 1:
3D cylindrical, with negligible z-coordinate to study implosion dynamics in r-theta geometry wedge (60 degrees)
Looking at effects of sinusoidal density perturbations
Result:
Future work will apply magnetic fields (uniform axial field or a 1/r azimuthal field)

Azimuthally uniform density



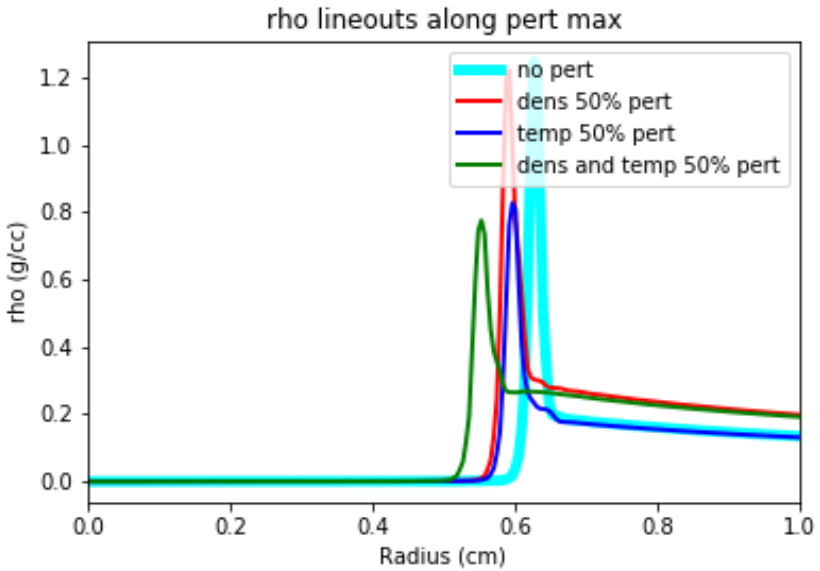
400 ns

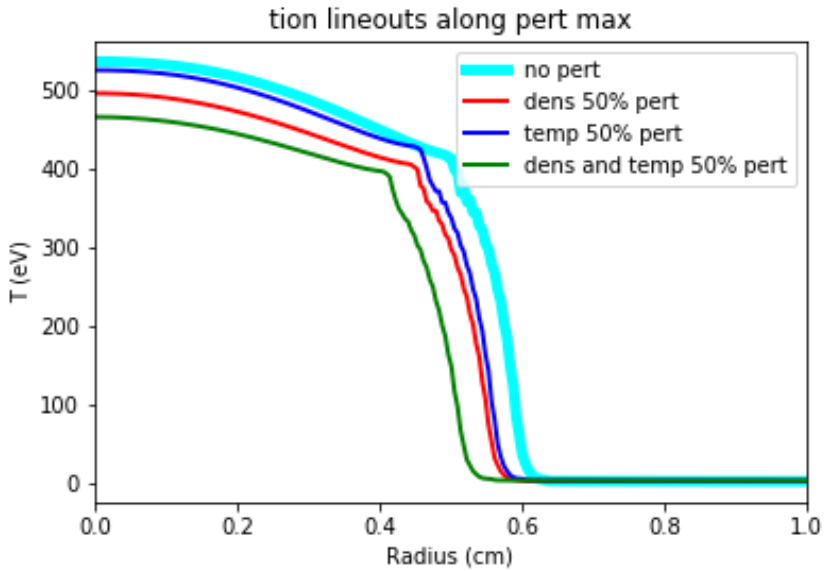
Sinusoidal density perturbation



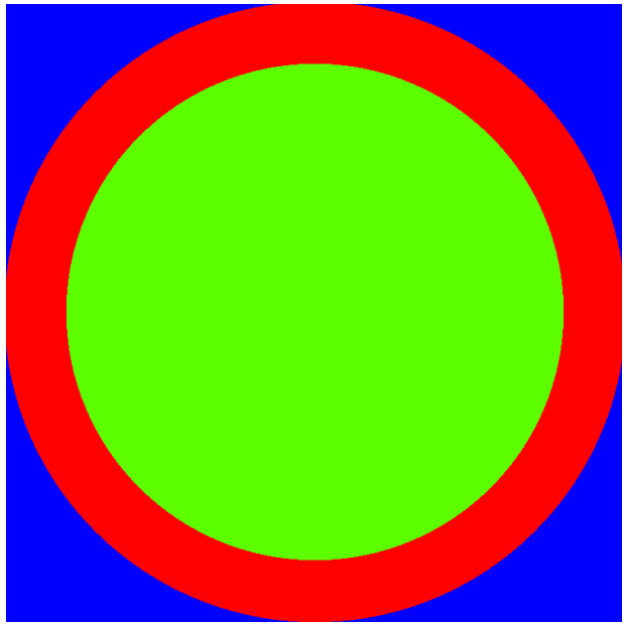
400 ns

For our fusion concept, we want a final target convergence ratio (= initial radius divided by radius at stagnation) of 10-15. At a convergence ratio of 8, we find that 50% sinusoidal density perturbations decrease the attained temperature but not drastically

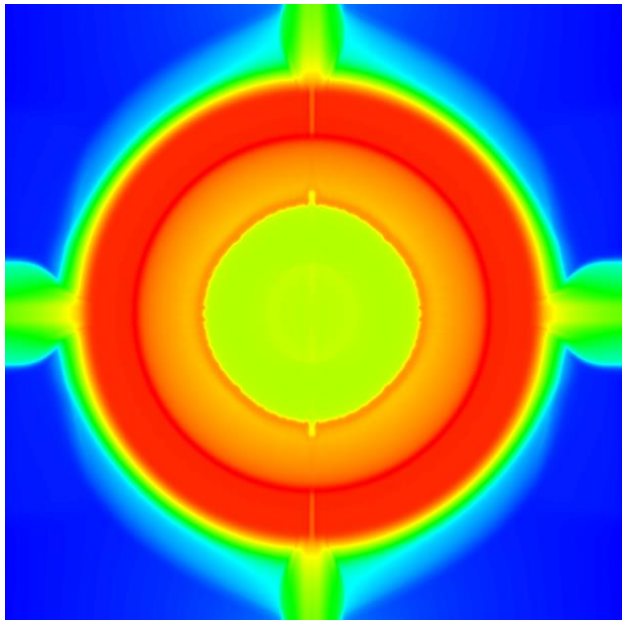




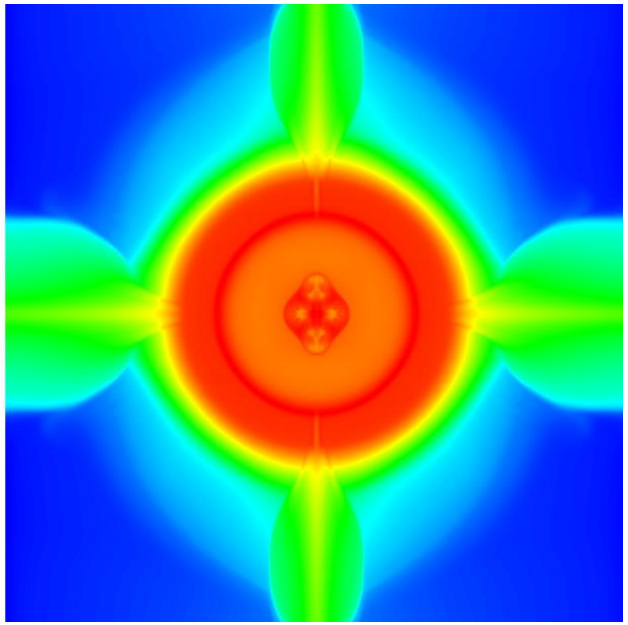
Simulation 2:
2D cylindrical, azimuthally symmetric to form a spherical target and liner
The spherical geometry may provide us with more relevant parameters to analyze our (spherical) fusion concept.
Want to look at effects of sinusoidal density perturbations
Results so far have shown grid perturbations influencing the implosion rather than the imposed nonuniformities
Future work will look at different parameters for the initial conditions, better grid resolution, and magnetic field effects



Density, Initial Conditions (0 ns)
are uniform for a given radius

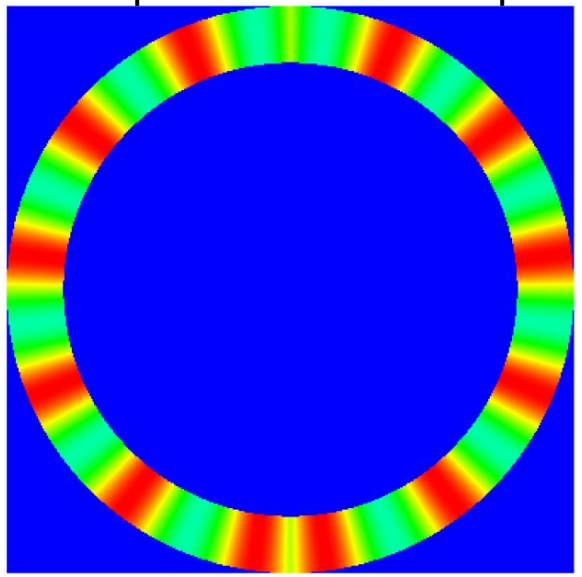


200 ns



400 ns

Liner perturbation example



Grid (square) perturbations clearly observed in target